

Name _____

AP Chemistry

Stoichiometric Calculations

Example #1:

Solid lithium hydroxide is used in space vehicles to remove exhaled carbon dioxide from the living environment by forming solid lithium carbonate and liquid water.

- (a) Write the balanced chemical equation for this reaction.

- (b) How many moles of water would be created if 41.8 moles of lithium hydroxide is used?

- (c) Based on the moles of water created, how many grams of lithium carbonate is made?

- (d) What mass of gaseous carbon dioxide can be absorbed by 1000 g of lithium hydroxide?

Example #2:

The decomposition of KClO_3 is commonly used to prepare small amounts of oxygen gas in the laboratory. In addition to oxygen gas, this decomposition also creates potassium chloride.

- (a) Write the balanced chemical equation for this reaction.

- (b) If 4.00 moles of potassium chloride is created, how many moles of KClO_3 were used to start with?

- (c) Based on the moles of KClO_3 started with, how many grams of O_2 are created?

(d) How many grams can be prepared from 4.50 g of KClO_3 ?

Questions:

1) Automotive air bags inflate when sodium azide, NaN_3 , rapidly decomposes to its component elements, sodium and nitrogen gas.

(a) Write the balanced chemical equation.

(b) How many moles of N_2 are produced by the decomposition of 1.50 mol of NaN_3 ?

(c) How many grams of NaN_3 are required to form 10 g of nitrogen gas?

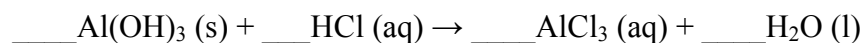
2) The complete combustion of octane (C_8H_{18}), a component of gasoline, results in carbon dioxide and water vapor.

(a) Write the balanced chemical equation.

(b) How many moles of O_2 are needed to burn 1.25 mol of C_8H_{18} ?

(c) How many grams of CO_2 are created from 10.0 g of octane?

3) Several brands of antacids use $\text{Al}(\text{OH})_3$ to react with stomach acid, which contains primarily HCl :



Balance the above chemical equation and calculate the number of grams of HCl that can react with 0.500g of $\text{Al}(\text{OH})_3$.